John Cuomo, the director of chemistry research at AgriDyne, the products have been accepted very well by growers, and the company continues to receive many requests for the products.

Although the neem seems to have endless possibilities, there are some disadvantages that need to be overcome. According to the NRC study, "the truth is that despite all its properties and promise, some impediments must be overcome and many uncertainties clarified before neem's potential can be fully realized." For example, neem products sometimes degrade and lose their pest-control properties when exposed to sunlight. This has been mitigated in some U.S. products by the addition of sunscreen. Cuomo said that the AgriDyne products do not contain sunscreen because it is not necessary for them to be effective. On a positive note, he said because of the UV breakdown and the hydrolysis of the neem products, they decompose rapidly, preventing buildup in the environment.

Although there appear to be few adverse human health effects of neem ingredients, further toxicity tests need to be conducted. Toxicity tests on fish and other wildlife also require investigation. Another disadvantage of the use of neem insecticides is that they kill insects by delayed action, so they work slower than synthetic pesticides. Consumers who have become accustomed to instant results may be impatient with the slower action of neem insecticides. Cuomo said that although AgriDyne's products are slow-acting, they are very effective if used for a full season.

Perhaps one of the greatest advantges of the neem is the fact that its fruits may be harvested without destroying the tree, making the neem more profitable standing than felled. As stated in the NRC report, "the use of neem products has the merit of promoting a greening of the earth."

Asthma Gene Is Nothing to Sneeze at

Approximately 5,000 people, many of them children, will die of asthma this year. Scientists have long known that allergic reactions to environmental irritants such as dust, pollen and other allergens, air pollution, and cigarette smoke trigger asthma attacks. They have now identified a gene that may contribute to susceptibility to asthma attacks by telling the body to overproduce a receptor for immunoglobulin E (IgE), an antibody involved in allergies.

Researchers led by William Cookson of John Radcliffe Hospital and Julian Hopkin of Churchill Hospital, both in Oxford, England, presented the new research in the June issue of *Nature Genetics*. When IgE binds to a protein receptor in cells lining the airways of the nose and chest, it sets off a series of events leading to an allergy attack. The gene found in the study contains the information for making part of the IgE receptor. The researchers found that people with a particular variant of the gene were likely to have high levels of IgE in their blood, an indicator of a tendency to allergy attacks. The researchers studied 60 families in which 10 had at least one person who had inherited both the variant and the allergic reaction. Of the 12 children who had the variant, all had allergic reactions, compared to only 2 of the children who did not inherit the variant.

The researchers stressed that the association was found only in a minority of the families, and that other genes may be implicated in asthma as well. Still, in an article by the Associated Press, Marshall Plaut, chief of the asthma and allergy branch of the National Institute of Allergy and Infectious Diseases, said, "I think they might have at least a partial answer, and it could be very important."

Any answers as to how and why people develop asthma would be good news to the 12 million Americans who suffer from it. But answers to these questions alone will not stop the increasing rates of asthma, which has become a major environmental health threat, particulary among inner-city children who are more often exposed to allergens and air pollution and may be especially sensitive to them. Misdiagnosis, mismedication or lack of treatment, and lack of the means to remove environmental contibutors to asthma are common in inner cities. Answers to these problems are also needed to prevent the increasing numbers of childhood deaths from asthma.

Recent studies sponsored by NIH and the National Center for Health Statistics (NCHS) show that African-American children who live in urban areas are more likely to develop asthma than white children who live in the suburbs and more likely to die from it due to a lack of diagnosis or treatment. In an article in the *Washington Post*, epidemiologist Diane Wagener of the NCHS said, "Deaths due to asthma among children should not happen, because it's a preventable situation." Public health officials say that although genetic research may help to identify individuals who may be susceptible to developing asthma, without adequate prevention and treatment measures the information has little worth.

Asthma Facts

- Asthma affects as many as 15 million persons in the United States.
- After hay fever, asthma is the most frequent chronic condition in persons under age 18. Nearly 5.1 million Americans under age 18 have asthma.
- Asthma was the underlying cause of 5,106 death in the United States in 1991 and the number is growing.
- Blacks with asthma are about three times as likely to die of asthma as are whites. Inner city black children are more likely to develop asthma than white children in suburban areas, and are less likely to receive treatment.
- The 1991 National Center for Health Statistics National Hospital Discharge Survey indicates that asthma was the first-listed diagnosis in 490,000 hospital admissions.
- In 1990, the cost for treatment of asthma was estimated at $6.2 billion. Forty-three percent of asthma's economic impact was associated with emergency room use, hospitalization, and death.

Source: National Institute of Allergy and Infectious Diseases

Making Headlines on Health

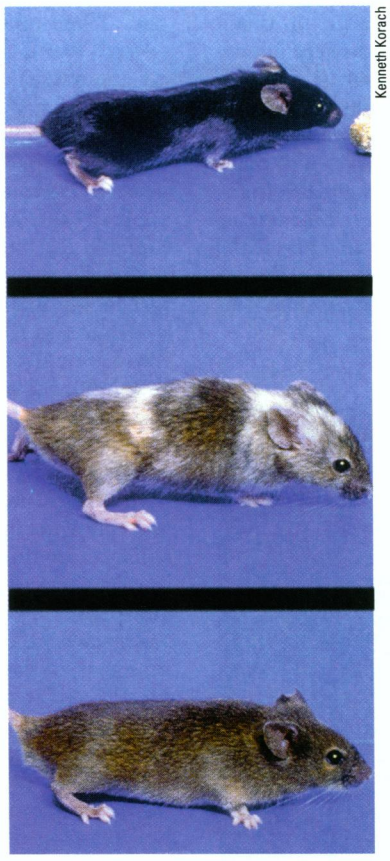
In a recent statement, David Satcher, director of the Centers for Disease Control, criticized the news media for giving too much coverage to attention-grabbing health-related stories and not enough to less sensational, more substantive issues. In October more than 400 environmental journalists gathered in Utah, in part to examine this and other complaints about their profession.

Speaking at the plenary session of the 1994 Annual Meeting of the Society of Environmental Journalists, Jim Detjen, an editor at *The Philadelphia Enquirer* and the former president of SEJ, said, "The line is becoming increasingly blurred between what is news and what is entertainment." Detjen cautioned his colleagues that the current focus on "telling stories" erodes the credibility of the press and detracts attention from serious environmental and health issues. Detjen's observations were echoed by other members of the plenary panel including Thomas Winship, chair of the Center for Foreign Journalists and a former editor of *The Boston Globe*; Noel J. Brown, special representative of the executive director of the United Nations Environment Programme; and F. Sherwood Rowland, winner of the 1983 Tyler World Prize in Ecology and Energy for his discoveries of the depletion of ozone by chlorofluorocarbons and the 1987 Award for Creative Advance in Environmental Science and Technology. Panelist Erin Hayes, a correspondent for ABC News in Chicago, advised journalists to avoid the danger of overdramatizing stories just to make them sexy enough to get on the air or in the paper. Said Hayes, "Environmental stories

need to be told with context and perspective so people know how it affects their lives."

Journalists at the conference were also encouraged to lessen their reliance on anecdotal evidence and pursue more quotes and information from science experts. In an attempt to bring more scientific expertise into the process of environmental reporting, scientists working in many of the "hot" areas of environmental health were brought to the conference to provide journalists with briefings on these topics. Researchers Theodora Colborn, senior scientist at the World Wildlife Fund, Inc., Earl Gray of the EPA's Health Effects Research Laboratory, and Stephen Safe, professor of toxicology at Texas A&M University, presented a seminar on the role of environmental estrogens and endocrine disruptors on reproductive health of humans and animals. A panel including Robert Alvarez, deputy assistant secretary for national security and environmental restoration of the Department of Energy, and Arthur C. Upton, clinical professor of pathology and radiology at the University of New Mexico School of Medicine, explored issues surrounding human health and exposure to radiation. Other sessions discussed topics such as biodiversity, a potential ban on chlorine, and media coverage of population issues.

EPA Administrator Carol Browner and Secretary of Energy Hazel O'Leary were among the government representatives to address the conference. Commenting on her agency's unsuccessful attempt to have Congress pass reforms of the Safe Drinking Water Act and Superfund, Browner said, "What we've run into is gridlock and obstructionism that is truly unprecedented." Actor and environmentalist Robert Redford, who hosted part of the conference at his resort in Sundance, expressed similar frustration with Congress for failing to enact environmental legislation. "[The environment] is continuously abused for short-term and even spurious gain," said Redford. "It makes me sick actually." Redford encouraged journalists to continue to focus citizens' attention on environmental and health issues.



Kenneth Korach

Motley crew. C57 black founder mice (top), bred with mice with disrupted ER genes (middle), produce mice that are heterozygous for ER disruption (bottom).

Pesticides and Food Safety

The EPA is formulating plans to regulate pesticides with an emphasis on food safety rather than agricultural use of chemicals. Under new proposed legislation, the agency would regulate the amount of pesticide residue on food, not just crops. Currently, the EPA monitors concentrations of pesticides on crops until just after harvest, while the new regulations would monitor food all the way to the supermarket shelf.

The agency is concerned about the amount of chemicals that are concentrated in food products. The plan aims to monitor food safety by moving backward though the food chain to the farm. New limits may be set based on how foods are likely to be consumed and would take into account that before foods are actually eaten, pesticides may wear off, be washed or peeled off, or diluted during processing. Industry is opposed to the proposed legislation because it would lead to tighter restrictions.

ER Gene Disruption Is a Knockout

In the last year scientists have developed a new tool for research on the effects of estrogen that is a real knockout . . . literally. Researchers have been able to knock out the estrogen receptor gene in mice to disrupt the expression of estrogen receptor protein in the hopes that experiments on these animals will yield new insights into development, fertility, and the effects of estrogenic drugs and environmental chemicals on the body.

Estrogens bind to the estrogen receptor protein to activate a variety of physiological responses including tissue differentiation, growth, protein synthesis, and hormone secretion. In 1990, researchers in the Laboratory of Reproductive and Developmental Toxicology at the NIEHS and the Department of Pathology at the University of North Carolina at Chapel Hill were able to successfully produce a strain of transgenic mice (called ERKO for estrogen receptor knockout) that are homozygous for disrupted function of the estrogen receptor. The researchers made two important discoveries from this exercise: first, crosses of heterozygous strains produced even sex ratios of homozygous ER-negative mice, indicating that sex determination is not influenced by the absence of a functional estrogen receptor, and second, this absence is not necessarily lethal, although the animals are infertile.

Scientists are excited about the possibilities of using this animal model to study the role of estrogen in a variety of diseases and health effects on humans. Said Kenneth Korach, chief of the receptor biology section of the NIEHS lab, "There is a question of estrogen's exact role and mode of action related to osteoporosis and cardiovascular disease. These ERKO mice should be a useful experimental model for answering the question of whether estrogen plays a direct role."

Because ERKO adult female mice have undeveloped mammary glands, Korach is attempting to cross mice with an increased incidence of mammary cancer with ERKO mice to test whether the estrogen receptor is necessary for development of breast cancer. Studies of the reproductive organs of female and male ERKO mice may provide information on infertility. Female ERKO mice have dysfunctional ovaries and may be useful for studying the effects of estrogen therapy. Studies of male ERKO mice, who appear to have normal male accessory sex organs but produce less than 10% as much sperm as normal mice, may be helpful in evaluating the role of the estrogen receptor in male reproduction.

Future studies in which ERKO mice are exposed to environmental estrogenic chemicals and hormonally active drugs such as tamoxifen and diethystilbestrol may help scientists understand whether these chemicals operate through the estrogen receptor signaling pathway to cause reproductive tract and other target tissue cancers in humans. According to Korach, creation of these animals and the observation of nonlethality led colleagues at the University of Cincinnati Medical School to the clinical identification of the first human patient with an estrogen receptor gene mutation. Said Korach, "Because both males and females are infertile due to loss of function mutations of the estrogen receptor, it brings up the possibility of whether human infertility may have a similar mutational basis. We are currently attempting to evaluate some of these cases."